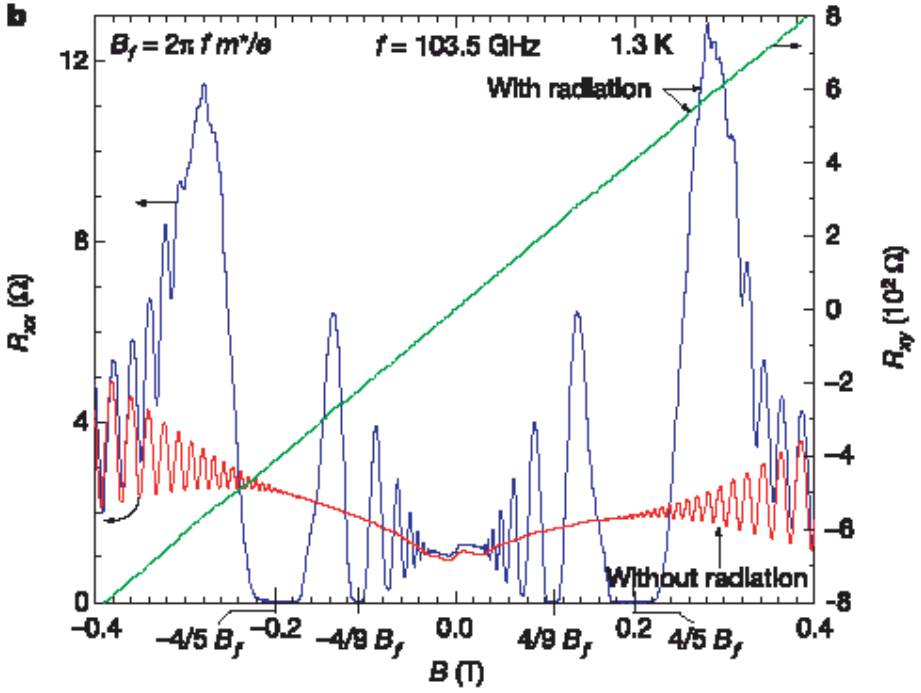
# Theory of the zero (dc) resistance state in the ac-driven 2DEG I

A. Andreev (Colorado); I. Aleiner and A. J. Millis (Columbia)

## 2DEG in constant B-field; ac E-field




**Shown: data from Mani et al Nature 420 646 '02; also discovered by Zudov et. al PRL90 046807 '03**

**At special values of B-field, dc resistance vanishes!**

**What's going on?? Spontaneous formation of new nonequilibrium domain structure**

NSF DMR-00081075 and 984002

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# Theory of the zero (dc) resistance state in the ac-driven 2DEG II

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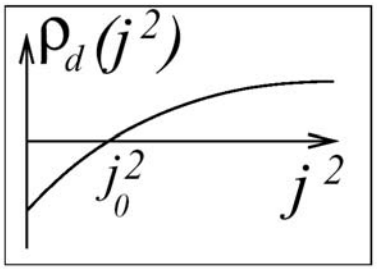
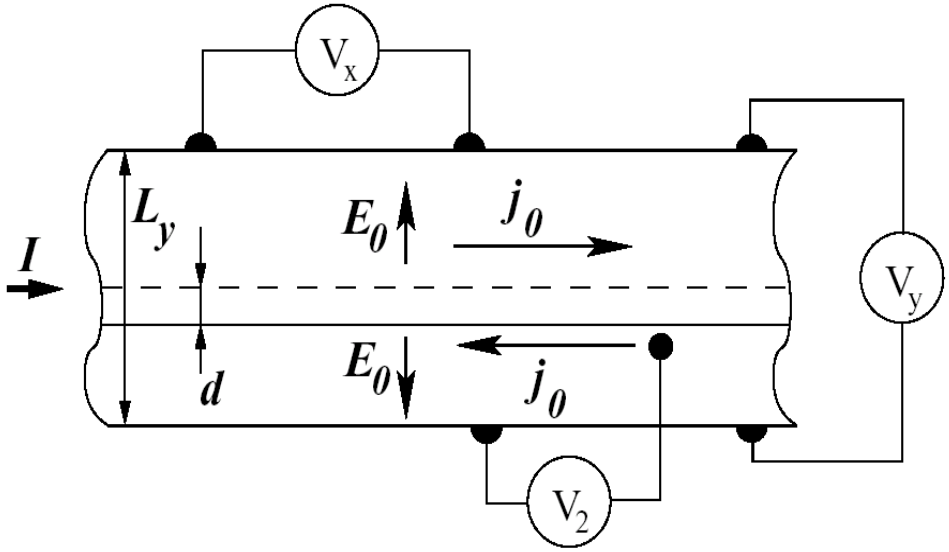
**Known: microwaves +B-field => resistance negative for small applied currents (see fig at right).**




**We find (PRL 91 056803):**

- **state of current $j \neq j_0$ <u>unstable</u> =>state of average $j<j_0$ made from domains where current= $j_0$**
- **adjust total I at $V_x=0$ by moving domain wall=>zero apparent resistance!!**

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